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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/749,748

12/30/2003

Jongmo Sung

2013P145

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7590

09/28/2007

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EXAMINER

WOZNIAK, JAMES S

ART UNIT

PAPER NUMBER

2626

MAIL DATE

DELIVERY MODE

09/28/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/749,748	<b>Applicant(s)</b> SUNG ET AL.	
	<b>Examiner</b> James S. Wozniak	<b>Art Unit</b> 2626	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 11-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Claim Objections*

2. **Claims 1-13** are objected to because of the following informalities:

In claims 1, 4, and 8, the abbreviation "CELP" should be expanded in order to clarify its meaning in the claims.

In claim 1, line 7, "on the basis" should be changed to --based on-- in order to overcome possible antecedent basis issues.

In claim 2, the tilt factor  $\mu$ , which refers to the preceding perceptual equation in the claim, seems to be instead directed towards a postfilter equation (*specification, page 4*), thus, it is believed that this limitation should be deleted from the claim.

In claim 3, line 5, “on the basis” should be changed to –based on-- in order to overcome possible antecedent basis issues.

In claim 5, line 6, “on the basis” should be changed to –based on-- in order to overcome possible antecedent basis issues.

In claim 8, line 12, “on the basis of” should be changed to –based on-- in order to overcome possible antecedent basis issues.

The remainder of the dependent claims fail to overcome the objections directed toward their parent claims, and thus, these claims are also object to due to minor informalities.

Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. **Claims 8-13** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

**Claim 8** is directed to a process for generating a mathematical filter function for a transcoding filter by performing a series of abstract mathematical operations (*generating a reference filter based on abstract perceptual weighting and post-filter characteristics and calculating a weight that minimizes a spectral distortion factor*). The final result in this process is an abstract transcoding filter equation, which is not a “useful, concrete, and tangible result”. In order to be considered statutory, the claimed invention as a whole must be useful and

accomplish a practical application. That is, it must produce a “useful, concrete and tangible result.” State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. Since the final result of claim 8 is only directed to the abstract transcoding filter equation (*i.e., transcoding filter*) and not to an encoded and transmitted real-world speech signal that has been filtered using the generated filter, claim 8 does not produce a “useful, concrete and tangible result”, and thus, is directed to non-statutory subject matter. Claims 9-13 fail to overcome the non-statutory subject matter issues of independent claim 8, and thus, are also rejected under 35 U.S.C. 101.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1-5 and 8** are rejected under 35 U.S.C. 102(e) as being anticipated by Jabri et al (*U.S. Patent Application Publication: 2004/0158463*).

With respect to **Claim 1**, Jabri discloses:

A decoding unit of an input CELP codec, which converts a bitstream encoded in an input CELP codec format into a speech signal (*unpacking means used to generate a speech signal from a coded CELP input, Paragraph 0033*);

A transcoding filter, which performs filtering of the speech signal decoded in the decoding unit of the input CELP codec with filter characteristics calculated by adapting an optimum weight to minimize spectral distortion on the basis of a reference filter (*weighting filter having a pair of weighting factors optimized for a highest voice quality (i.e., minimal distortion) and with respect to source and destination codecs comprising filtering means, Paragraphs 0035-0036, 0041; and 0005-0006*);

A transcoding filter design unit, which extracts the optimum weight to minimize spectral distortion of the transcoding filter from a weight set, and then supplies the optimum weight to the transcoding filter (*determining the optimum pair of possible weighting factors that maximize voice quality or minimize distortion and utilizing such factors in a weighting filter, Paragraphs 0035-0036 and 0041*); and

An encoding unit of an output CELP codec, which generates a bitstream in an output CELP codec format by encoding the speech signal filtered in the transcoding filter (*packing module that packs a destination codec bitstream, Paragraph 0030*).

With respect to **Claim 2**, Jabri discloses a more general form of the perceptual weighting equation that is well known in typical CELP coding and recited in claim 2 (*Paragraphs 0035-0036*). Jabri further discloses post-filtering used at a receiver in typical CELP decoding (*Paragraph 0005*), which would inherently include a well-known tilt compensation factor.

With respect to **Claim 3**, Jabri further discloses:

A procedure to generate the reference filter for evaluating the transcoding filter using characteristics of a perceptual weighting filter and post-filter of the input CELP codec and a perceptual weighting filter of the output CELP codec (*weighting filter having a pair of weighting*

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*factors optimized with respect to source and destination codecs comprising filtering means, Paragraphs 0035-0036, 0041, wherein the input CELP encoder comprises perceptual and synthesis filters and the output CELP decoder comprises a perceptual weighting filter, 0005-0006); and*

On the basis of the reference filter, a procedure to evaluate a transcoding filter weight as an optimum weight when spectral distortion is minimum (*determining the optimum pair of possible weighting factors that maximize voice quality or minimize distortion with respect to source and destination codecs comprising filtering means, Paragraphs 0035-0036 and 0041*).

With respect to **Claim 4**, Jabri discloses:

(A) Generating a transcoding filter, which has perceptual weighting filter characteristics, to which a weight minimizing a spectral distortion is applied (*determining the optimum pair of possible weighting factors that maximize voice quality or minimize distortion, Paragraphs 0035-0036 and 0041*);

(B) Converting a bitstream encoded in an input CELP codec format into a speech signal (*unpacking a speech signal from a coded CELP input, Paragraph 0033*);

(C) Filtering a speech signal generated in step (B) with the transcoding filter generated in step (A) (*utilizing determined weighting factors in a weighting filter, Paragraphs 0035-0036 and 0041*); and

(D) Generating a bitstream of an output CELP codec format by encoding the speech signal filtered in step (C) (*packing a destination codec bitstream, Paragraph 0030*).

**Claim 5** contains subject matter similar to Claim 3, and thus, is rejected for the same reasons.

With respect to **Claim 8**, Jabri discloses:

A method of designing a transcoding filter of the transcoder which includes a decoding unit of an input CELP codec, which converts a bitstream encoded in an input CELP codec format into a speech signal (*unpacking means used to generate a speech signal of a source or input CELP codec, Paragraph 0033*), a transcoding filter which performs filtering of the converted speech signal with perceptual weighting filter characteristics (*perceptual weighting filter having weighting parameters, Paragraphs 0035-0036, 0041*), and an encoding unit of an output CELP codec, which generates a bitstream of an output CELP codec format by encoding the filtered speech signal (*packing module that packs bitstreams in a destination codec format, Paragraph 0030*), comprising:

(A) Generating a reference filter by using characteristics of a perceptual weighting filter and post-filter applied to the input CELP codec and of the perceptual weighting filter applied to the output CELP codec (*weighting filter having a pair of weighting factors optimized with respect to source and destination codecs comprising filtering means, Paragraphs 0035-0036, 0041, wherein the input CELP encoder comprises perceptual and synthesis filters and the output CELP decoder comprises a perceptual weighting filter, 0005-0006*);

(B) Selecting an optimum weight which minimizes a spectral distortion of the transcoding filter from a pre-selected weight set on the basis of the reference filter (*determining the optimum pair of possible weighting factors that maximize voice quality with respect to source and destination codecs, Paragraphs 0035-0036 and 0041*); and

(C) Generating the transcoding filter by applying the weight selected in step (B) (*utilizing selected weighting factors in a weighting filter, Paragraphs 0035-0036 and 0041*).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 6-7 and 9-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jabri et al in view of Chen et al (*U.S. Patent: 6,144,935*).

With respect to **Claim 6-7**, Jabri discloses the transcoding device that selects weighting factors with respect to source and destination coders comprising coding means, as applied to Claim 5. Also, Jabri further discloses:

Extracting an LPC coefficient by decoding a bitstream encoded in the input CELP codec format (*generated LP coefficients from a current speech segment, Paragraphs 0033 and 0035-0036*); and

Evaluating the perceptual weighting filter to be used in the output CELP codec by using the LPC coefficient obtained in the previous step (*perceptual weighting equation utilizing LP coefficients, Paragraphs 0035-0036; and source encoder comprising a perceptual weighting filter, Paragraph 0006*)).

Although Jabri discloses choosing weighting factors based on source and destination coders, respectively comprising perceptual weighting and perceptual weighting compensation means (*Paragraphs 0005-0006*), Jabri does not teach selecting weighting factors by combining a compensation or inverse filter and a perceptual weighing filter in series. Chen, however,

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discloses a tandem encoder/decoder that selects tunable weighting factors,  $\gamma_1$  and  $\gamma_2$ , based on a product (*i.e., series*) combination of a perceptual weighting filter equation and a long term postfilter that compensates for spectral tilt that results from perceptual weighting (*the factor  $\mu$* ) (*Col. 5, Lines 10-61*).

Jabri and Chen are analogous art because they are from a similar field of endeavor in tandem encoders/decoders. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Jabri with the weighting filter calculation technique taught by Chen in order to improve performance of vocoders in a tandem configuration (*Chen, Col. 3, Lines 28-35*).

**Claims 9-10** contain subject matter similar to Claims 6-7, and thus, are rejected for the same reasons.

#### *Allowable Subject Matter*

9. **Claims 11-13** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and rewritten to overcome the above 35 U.S.C. 101 rejections.

10. The following is a statement of reasons for the indication of allowable subject matter:

With respect to **claim 11**, the prior art of record does not explicitly teach or fairly suggest, either individually or in combination, a method for selecting transcoding filter weights in the transcoder defined in claim 8 based on a reference filter generated using the characteristics

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of a perceptual weighting filter and post-filter applied to an input CELP codec and a perceptual weighting filter applied to an output CELP codec, wherein, the step of selecting comprises: (B1) randomly selecting one weight pair from a weight set; (B2) evaluating the transcoding filter by applying the selected weight pair to the transcoding filter having a perceptual weighting filter form; (B3) calculating a frequency response of the transcoding filter evaluated in step (B2); (B4) calculating a spectral distortion of the transcoding filter by comparing the frequency response of the reference filter with a frequency response calculated in step (B2); (B5) calculating the spectral distortion corresponding to each weight pair by performing steps (B2) through (B4) for every weight pair from the weight set; (B6) selecting a weight pair resulting in a minimum spectral distortion as the optimum weight pair.

Closest Prior Art:

Although Jabri et al (*U.S. Patent Application Publication: 2004/0158463*) evidences that it is well known in the prior art to implement a perceptual weighting or transcoder filter in a transcoding device, design or select weights for such a filter based on source and destination codecs comprising filtering means (*Paragraphs 0035-0036 and 0041*), and additionally evaluate multiple weighting factor pairs to determine which pair results in the least spectral distortion or highest voice quality (*Paragraphs 0035-0036*), Jabri does not evaluate the distortion used to select the perceptual weighting parameter pair in the same manner as that recited in claim 8. Claim 8 specifies that a distortion is calculated by comparing a frequency response generated by utilizing multiple weight pair sets in the perceptual weighting filter of the transcoder to a frequency response of the reference filter detailed in the previous paragraph. Jabri, on the other hand, discloses that a lowest distortion (i.e., highest voice quality) used to select weighting

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factors with respect to source and destination codecs is measured in the signal (*Paragraph 0036*) and does not result from a direct comparison between the frequency responses of the reference filter and the perceptual weighting filter operating with specific weighting parameters. Thus, Jabri does not explicitly teach or fairly suggest the invention recited in claim 8. **Claims 12 and 13** contain claim language identical to claim 11, and thus, these claims also contain allowable subject matter for the same reasons.

### *Conclusion*

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Mermelstein et al (*U.S. Patent: 5,995,923*)- discloses a transcoding method utilizing tandemed vocoders.

Dejaco (*U.S. Patent: 6,260,009*)- discloses a CELP-to-CELP transcoder utilizing a perceptual weighting filter.

Ojala et al (*U.S. Patent: 6,584,441*)- discloses an adaptive postfilter regulated by means of weighting factors.

Jabri et al (*U.S. Patent: 6,829,579*)- discloses a transcoder having a tunable weighted synthesis filter.

Jabri et al (*U.S. Patent: 7,184,953*)- discloses a transcoder having a tunable weighted synthesis filter.

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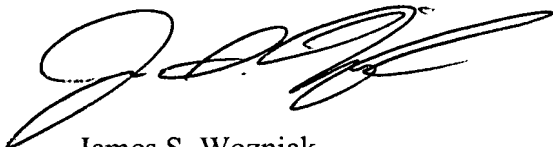
Jabri et al (*U.S. Patent Application Publication: 2004/0172402*)- discloses a transcoder utilizing CELP parameter mapping and a weighted synthesis filter.

Kim et al (*"An Efficient Transcoding Algorithm for G.723.1 and EVRC Speech Coders," 2001*)- discloses a device for transcoding EVRC to G.723.1 utilizing a perceptual weighting filter and post filter.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



James S. Wozniak  
9/21/2007